RFP-1325.02 (REV. 9/97)
Previously RF-46522

CORRES. CONTROL
INCOMING LTR NO.

01529 RF 97

DUE DATE

ACTION

DIST.	LTR	ENC
BACON, R.F.		
BENSUSSEN, S.J.		
BORMOLINI, A.M.		
BRAILSFORD, M.D		
BURDGE, L		
CARD, R.G.		
COSGROVE, M.M.		
COULTER, W.L.		
CRAWFORD, A.C.		
DERBY, S.		
DIETERLE, S.E.		
FERRERA, D.W.		
FERRERA, K.P.		
GERMAIN, A.L.		
HARDING, W.A.		
HARROUN, W.P.		
HEDAHL, T.G.		
HERRING, C.L.		
HILL, J.A.	X	X
MARTINEZ, L.A.		
NORTH, K.		
OGG, R.N.		
PARKER, A.		
PHILLIPS, F.J.	X	X
RHOADES, D.W.		
RUSCITTO, D.G.		
SANDLIN, N.B.		
SPEARS, M.S.		
TILLER, R.E.		
VOORHEIS, G.M.	X	X
Shelton	X	X

COR CONTROL	X	X
ADMIN RECORD	X	X
PATS/T130G		

Reviewed for Addressee
Corres. Control RFP

10/16/97 By
Date

Ref Ltr. #

DOE ORDER # None

Department of Energy

ROCKY FLATS FIELD OFFICE
P.O. BOX 928
GOLDEN, COLORADO 80402-0928

16 OCT 97 10:1d

- RFETS-CC-

97-DOE-05489

OCT 10 1997

OCT 1997

Mr. Steve Tarlton
RFCA Project Coordinator
Colorado Department of Public Health and the Environment
4300 Cherry Creek Drive South, OE-B2
Denver, CO 80222-1530

Dear Steve,

This is in response to your letter of September 9, 1997, regarding the Plutonium and Highly Enriched Uranium Vulnerability Assessment and the related Rocky Flats Cleanup Agreement (RFCA) Target Activity 97T1. Enclosed is a complete set of corrective action plans for both the Plutonium and Highly Enriched Uranium Vulnerability (HEU) Assessments. These corrective action plans complete the RFCA target activity (97T1), "Identify corrective actions for the plutonium and HEU vulnerabilities by 9/30/97". Additionally, in response to concerns about the methodology by which the corrective actions are statused, enclosed (Enclosure II) is a listing of the vulnerabilities and their current status: open; corrective actions complete pending the Department of Energy (DOE) review; or closed by the DOE.

In your letter you also mention that the classification criteria used to report the progress of the vulnerabilities is unclear. The site uses a reporting methodology established by the DOE headquarters. We do agree that without the definitions for each category, the status of each vulnerability can be confusing. We have tried to include enough information in each corrective action plan so it is understandable how the vulnerability will be closed out.

It is important to understand that some vulnerabilities will not be physically closed out until the site or facility is closed or the material is moved from the facility or site. One type of vulnerability that falls into this category is very low probability accidents, the correction of which we believe should be deferred in order to attack higher risks. An example of this type of vulnerability would be the plutonium vulnerability #559-05 "Aircraft crash resulting in the release of material off-site". This vulnerability is recognized as having a very low probability of occurrence and the fiscal expenditures necessary to rebuild or upgrade Building 559 in order to make it resistant to airplane crashes if carried out would subjugate other higher risk reduction activities such as solution stabilization, off-site nuclear material shipments, off-site waste shipments, facility deactivation and decommissioning, etc.

Attachment I

KAISER•HILL
COMPANY

September 26, 1997 97-RF-05171

Henry F. Dalton
Assistant Manager for
Material Stabilization & Disposition
DOE, RFFO

SUBMISSION OF HEU VULNERABILITY CORRECTIVE ACTION PLANS FOR RFCA 97T1 COMPLETION - GMV-409-97

The attached corrective action plans for the 1996 Highly Enriched Uranium (HEU) Vulnerability Assessment incorporates comments made by your staff to the September 10, 1996 submission (ltr 96-RF-05192) and updates work that is complete or provides a better estimate of work yet be completed. The Rocky Flats Compliance Agreement (RFCA) target for this activity expects approval of the corrective action plans by September 30, 1997. Your earliest review and approval of these corrective action plans are appreciated to meet this suspense date.

G. M. Voorheis
Vice President
Nuclear Operations

LLR:pas

Orig. and 1 cc - Henry F. Dalton

Attachment:
As Stated

cc:
Dave Nickless

Kaiser-Hill Company, L.L.C.
Courier Address: Rocky Flats Environmental Technology Site, State Hwy. 93 and Cactus, Rocky Flats, CO 80007 • 303.966.7000
Mailing Address: P.O. Box 464, Golden, Colorado 80402-0464

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-371-001, Health physics barrier compromise egress in Building 371.
Health physics ropes are strongly tied (vice adhered with tape or Velcro) across exterior emergency exits and present injury hazards to workers.

INTERIM COMPENSATORY MEASURES

NONE

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Replace fixed ropes with break-a-way barriers (adhered with tape or Velcro).

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- All barriers replaced or verified compliant. This was completed on 9/3/96.

Close this vulnerability as a Category 1A Closure.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-371-002, Authorization basis documentation in Building 371 does not address current hazards and operations.

Currently the facility operates without an updated FSAR, for the current operations being conducted. The PHA and the FHA have not been validated. The facility is currently drafting a BIO to address current operations.

INTERIM COMPENSATORY MEASURES

- Detailed reviews of the current FSAR/OSR have been performed to identify any weaknesses or compliance issues.
- Corrective actions have been taken to assure that OSR compliance is being maintained.
- Unreviewed Safety Question Determinations (USQD) have been performed to evaluate proposed changes and potential issues.
- The OSR Page Change process has been improved to provide for timely issue resolution.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Develop and implement the Basis of Interim Operation (BIO), with safety analysis based on current stored hazard and mission.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- The BIO will be the Authorization Basis of Record, August 1, 1998 (JCO's Action Plans, etc. will be in place to cover open issues). Phased approach to the BIO Implementation will begin on October 1, 1997, and is expected to meet the DOE expectations for Integrated Safety Management.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-707-001, Criticality resulting from seismic event in H-Vault
Shelves in H-Vault that contain HEU have engineered restraints that prevent hemishells from falling off the shelves into a critical array during a seismic event. The criticality safety limit (CSOL 930069/SA-1.3-5/5/16.0.1-1) allows small pieces other than hemishells that will not be restrained by the engineered feature. This seismic scenario was not considered in the criticality safety evaluation.

INTERIM COMPENSATORY MEASURES

NONE Proposed corrective actions to closure are immediate and the risk is acceptable considering the low probability of occurrence (1.1×10^{-3}) of a seismic event (.18 g ground acceleration).

PROPOSED CORRECTIVE ACTIONS TO CLOSURE
- The quantity of HEU contained in the small pieces and its potential to form a critical geometry during a seismic event will be determined and reviewed.
- If sufficient material can be accumulated to potential cause a criticality, revisions to the criticality safety evaluation and Criticality Safety Operating Limits will be made. If accumulation of material cannot occur to cause a potential criticality, no changes will be made.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES
- The safety review is complete with the conclusion that a criticality in this scenario has a low probability of occurrence.
- Changes to Criticality Safety Operating Limits are not necessary

This vulnerability is closed as a Category 1A.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-771-001, Health physics barriers and pneumatic door operation may compromise egress in Building 771.

A sliding exit door from the 771 building annex relies on pneumatic operation of a weighted door opener. If this device were to fail the door can still be opened, but only with extreme effort beyond the capabilities of many site personnel. Health physics rope firmly tied across exterior emergency exits also presented hampered egress.

INTERIM COMPENSATORY MEASURES

- The sliding door was evaluated by the Building 771 Industrial Safety representative and determined it to not present a significant concern. The individual was able to stand facing the door and open it manually with one arm. Following an actual power outage in August 1996, a complaint was received from a building employee that the door was difficult, but not impossible to open during the outage. Facility Management requested an evaluation from Engineering, resulting in the decision to put the door on emergency power, to preclude the problem. A work request is written to pace the door on emergency power.
- The rope was removed and replaced with rope that is attached with Velcro, allowing removal with only a slight tug.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- The pneumatic sliding door will be place on Emergency Power.
- The Health Physics rope is removed.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- A safety evaluation will be performed by December 30, 1997 and if warranted the pneumatic sliding door will be placed on emergency power.
- The Health Physics rope was replaced and verified by the Facility Manager on August 14, 1996.

This vulnerability can be closed as a Category 1A Closure

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS MOST SIGNIFICANT VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-771-002, Excessive combustible loading in Room 283, main fan room, of Building 771

Room 283, Main Fan Room, in Building 771 contains significant combustible loading. If ignited the resultant fire may overwhelm the installed fire sprinkler system leading to loss of ventilation, dispersion of particulate from filters, and perhaps fire spread to material control areas, or to the environment.

INTERIM COMPENSATORY MEASURES

- Increased awareness of situation by building personnel.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Survey combustibles for radiological contamination.
- Remove the combustible loading from the building for reuse, or disposal as radioactive waste.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Radiological survey scheduled for August 8, 1996 is complete.
- Combustible loading removal scheduled for August 30, 1996, is complete. Two crates of waste were removed from the building on August 8, 1996.

This vulnerability can be closed as a Category 1A Closure.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-771-003, Deterioration of Highly Enriched Uranyl nitrate solutions in drums in Building 771. There is a drum that contains 10 plastic bottles full of EU nitrate solutions. This material form is not a stable storage form and can cause storage container(s) barrier failure and dispersal EU.

INTERIM COMPENSATORY MEASURES

- A review of the current population of bottles containing uranium solutions was completed August 27, 1996. Bottles with uranium solutions greater than 5 grams per liter are in glovebox storage awaiting the start-up of hydroxide precipitation. Bottles in glovebox storage are inspected regularly to detect deterioration prior to bottle failure. Solutions are transferred to new bottles if deterioration is detected.
- The review also showed the only bottles stored in drums were those with less than 2 grams per liter uranium. These bottles will be treated through the bottle box process (cementation). This inventory of uranium solutions is being processed at a rate of 2 to 3 drums per week. All drums are stored in accordance with HSP 31.11

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Uranium solutions greater than 5 grams per liter will be processed by precipitation with magnesium hydroxide and cementation of the remaining liquids. Uranium solutions with less than 5 grams per liter will continue to be processed through the bottle box. The uranium/plutonium precipitates will be stored and ultimately stabilized by thermal stabilization.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Hydroxide precipitation of the uranium solutions was completed by March 1997. Cementation of the low-level uranium solutions was completed by May 1997. The specific drum containing the 10 plastic bottles, identified in this vulnerability assessment, has been processed through the bottle box process and no longer poses a potential threat.

This vulnerability can be closed as a Category 1A Closure.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS MOST SIGNIFICANT VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-771-004, HEU materials in Building 771 collocated with tanks and piping having H_2 buildup

Subsequent to the Pu Vulnerability, radiolytic H_2 buildup exceeding the lower explosive limit was detected in four high Pu concentration tanks.

Room	Tank	Volume, liters	Gm-Pu/liter
114	D-550	230	130
149	D-931	260	96
149	D-933	116	95
180A	D-1810	173	140

These Pu tanks are collocated with tanks that contain HEU nitrate solutions. Operator error could cause one or more of these tanks to explode causing internal facility damage with release of contents, contamination and/or injury to workers, and release of collocated hazardous materials.

INTERIM COMPENSATORY MEASURES

- An Unreviewed Safety Question Determination (USQD) currently requires locked and tagged valve lineup for continuous venting of the tanks, periodic sampling for H_2 levels and inert purging with argon gas followed by a continuos air purge.
- Air purging is maintained and monitored to keep H_2 concentrations below the lower explosive limit of four percent.
- Equipment modifications are in process to control H_2 concentrations to less than the National Fire Prevention Association limit of one percent.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Current plans support stabilization of liquids in Building 371 with the resulting oxides packaged into the DOE Standard 3013 storage container.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- The tanks containing HEU nitrate solutions are drained into plastic bottles and the solutions have been processed.
- All SNM liquids in Building 771 will be removed by September 1998, based on current schedules.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-771-005, Authorization basis documentation in Building 771 does not address current hazards and operations.

Currently the facility operates without updated FSAR, for the current operations being conducted.

INTERIM COMPENSATORY MEASURES

- Detailed reviews of the current FSAR/OSR have been performed to identify any weaknesses or compliance issues.
- Corrective actions have been taken to assure that OSR compliance is being maintained.
- Unreviewed Safety Question Determinations (USQD) have been performed to evaluate proposed changes and potential issues.
- The OSR Page Change process has been improved to provide for timely issue resolution.
- Justification for Continued Operations (JCO) have been approved by DOE, RFFO for specific risk reduction activities, based on activity-specific safety analysis and readiness criteria.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Develop and implement a new Basis For Operation (BFO), with safety analysis based on current stored hazard and mission. This BFO will authorize all currently planned risk reduction activities.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- The BFO was developed by December 31, 1996 and approved by the DOE, RFFO in January 31, 1997.
- Total implementation for the BFO is expected to be completed by December 31, 1997. This implementation is expected to meet the DOE expectations for Integrated Safety Management.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-776/777-001, Plastic in contact with Pu contaminated HEU materials.
Parts located in the 776/777 complex have Pu contamination. These parts are stored in two plastic bags and placed on a cart or shelf. This method is a time proven method for packaging HEU without Pu surface contamination. However there exists detectable discoloration and visual distortion which potentially represent degradation of the inner bag. This is likely the result of the incompatibility of Pu and plastics.

INTERIM COMPENSATORY MEASURES

- Increased awareness of the situation by building personnel.
- Since the permanent corrective action will involve the handling of the subject items, visual inspections will be performed and additional awareness of neighboring items will be heightened.
- Routine radiological surveys are being conducted per Site procedures.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- All of the enriched uranium hemishells, including those contaminated with Pu, will be shipped off-site.
- Prior to shipping, those hemishells with Pu contamination will be decontaminated to less than 20 dpm/100 cm^2 via the electrolytic decontamination system developed at Los Alamos National Laboratory.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Installation of the electrolytic decontamination system was completed in Building 707 A Module, and began operation in May 1997 and production in August 1997.
- All hemishells that require decontamination are scheduled to be complete before June 1999, to support the SNM Shipping Schedule.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-776/777-002, Authorization basis documentation in Building 776/777 does not address current hazards and operations.

Currently the facility operates without updated FSAR, for the current operations being conducted.

INTERIM COMPENSATORY MEASURES

- Detailed reviews of the current FSAR/OSR have been performed to identify any weaknesses or compliance issues.
- Corrective actions have been taken to assure that OSR compliance is being maintained.
- Unreviewed Safety Question Determinations (USQD) have been performed to evaluate proposed changes and potential issues
- The OSR Page Change process has been improved to provide for timely issue resolution.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Develop and implement a Basis for Interim Operation (BIO)

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- The BIO will be submitted to DOE by March 31, 1998, and implementation on a graded approach is scheduled be completed by December 30, 1998.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-881-001, Unknown material in drums in Building 881.
Approximately 150 unidentified drums are stored within a tunnel vault along with two drums known to contain HEU. A few of the drums are labeled "Plastic Tent Material" but the vast majority have no identification. Facility management believes HEU is present but no criticality limits identified this possibility. A fire sprinkler in the tunnel provides the potential for flooding, providing moderation.

INTERIM COMPENSATORY MEASURES
- All drums have been identified and characterized through the Waste Environmental Management System (WEMS). All drums are labeled and have been recently inventoried.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE
- All drums have been identified as Low Level Waste (LLW) but an accurate radiological content cannot be determined until the drums are transferred to a Drum Counter for radiological results.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES
- This activity is included in the backlog inventory awaiting Drum Counter availability. Current schedule projections estimate completion of radiological surveys by the end of second quarter, FY 98.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-881-002, Unknown holdup in piping and ducts in Building 881.
The amount of HEU contained in old process piping and in the HVAC system is unknown but has been estimated to be as much as 5 Kg. Radiologic surveys have been performed for transuranic elements but none for HEU.

INTERIM COMPENSATORY MEASURES

- Building 881 has been posted to meet the requirements of Chapter 2 of the RFETS Radiation Control Manual (RCM).
- The process drains and HVAC system have been labeled per Article 412 of RFETS RCM. During maintenance and use of the HVAC system, the measures described in Article 452 and 453 have been put into place.
- All areas of Building 881 are radiologically monitored to meet the applicable requirements of Articles 551, 552, 553, 554, and 555 of the RFETS RCM.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Train building personnel to the posting and maintenance requirements of Building 881 and ensure Radiological Protection Supervision concurs with all changes, entry, maintenance and uses of any system in this Fixed Contamination Facility. This will be done by ensuring building personnel understand Chapter 1, Part 2 of RFETS RCM.
- Perform radiological surveys per the Integrated Work Control Process (IWCP) procedures for specific maintenance requirements or prior to securing the systems for decommissioning purposes.
- At the time of deactivation, characterization surveys will be performed.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Train building personnel to meet the requirements of Chapter 1, part 2 of RFETS RCM. Building personnel are retrained on a continuing basis.
- Perform surveys when determined necessary by maintenance criteria.
- In the 10 Year Plan, Building 881 deactivation is scheduled to occur in FY 2003 through 2005.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-881-003, Authorization basis for Building 881 does not address current hazards and operations. Draft Safety Analysis Report for Building 881 was completed in 1979 but was never approved nor upgraded to address current hazards or conditions.

INTERIM COMPENSATORY MEASURES

- Detailed facility walkdowns have been performed in support of hazard identification and characterization.
- Facility Management has identified those areas of greatest concern relative to process holdup and work performed in the building is only approved by Facility Management using Site infrastructure controls.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- The Site Safety Analysis Report (SAR) includes a specific Facility Safety Assessment for Building 881. This authorization basis document will define facility-specific controls, based on the current hazards and mission.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- The Site SAR was submitted to DOE, RFFO for review in September 1996, and updated in April 1997. Approval is expected by April 1998.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-881-004, Lack of HEPA filter testing.
Building has potential radiological release from various sources. The exhaust HEPA filters have not been DOP tested since 1987. HEPA efficiency is in doubt. HEPA leakage paths may exist.

INTERIM COMPENSATORY MEASURES

- Monthly surveillances are conducted for exhaust filter airflow for the first and second stage filters. These readings are recorded in a log book and kept in the Utilities office in Building 881. The trends for the readings show a pressure differential of less than 0.5 inches water gage for these filters.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Monthly surveillances will continue. In addition, a request for an Unresolved Safety Question Determination (USQD) on DOP testing will be forwarded for processing.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Completion of the USQD review is scheduled to be accomplished by the end of the first quarter of FY 1998.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-883-001, Negative pressure not maintained in a radiologically controlled building (Building 883).

Negative pressure could not be maintained and air flow is not balanced in a radiologically controlled building. Potential contamination release from the facility is possible. Amount of Uranium holdup is unknown but is believed to be less that 1 Kg.

INTERIM COMPENSATORY MEASURES

- In the unlikely event that negative pressure in the building is not maintained, compensatory actions to evacuate personnel from the contaminated area is required and a request is made for Radiological Operations Support to survey and clear the area before re-entry.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Room airflow surveys have been completed, and data provided found adequate airflow, even at reduced airflow. Surveys provided do not show a contamination problem. Adequate negative pressure in the building has been maintained, and continues to be maintained.
- A request for an Unresolved Safety Question Determination (USQD) on DOP testing will be forwarded for processing.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Airflow imbalance within the building is considered closed as a result of rebalancing the airflow and the data from the surveys.
- Completion of the USQD review should be accomplished by the end of the first quarter of FY 1998.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-886-001, Excessive combustible loading in Room 101, Building 886.
Room 101 contains significant combustible loading and no sprinklers. Fire would destroy the walk-in containment booth and the plastic piping containing HEU solution. Inadvertent criticality is possible. The fire could spread to Room 103 resulting in collapse of the steel deck ceiling and rupture of the storage tanks in Room 103.

INTERIM COMPENSATORY MEASURES

- Building personnel have been made aware of the situation, and no operations are taking place in Room 101.
- The Highly Enriched Uranium Nitrate (HEUN) previously stored in Room 103 is shipped off-site. Draining of tanks and lines is complete with less than 2 Kg. of HEU held up in the entire building which makes an inadvertent criticality a very low probability event. Resources continue to be employed to reduce the fire hazard associated with surplus material storage in Room 101.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Elimination of the combustible materials from Room 101 is planned as part of the facility deactivation. Deactivation will also reduce the remaining amount of HEUN holdup in the building.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Deactivation of Building 886 is scheduled to begin in FY 98 and the combustible materials are planned to be removed by the end of FY 98.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-886-002, No safe egress route in the event of a criticality in Room 103 or fire in Room 101 in Building 886.

Room 103, with the greatest inventory of HEU, is the most likely site for a nuclear incident. However, the only exits from Room 101 and 102 route personnel toward and adjacent to Room 103, rather than away from the hazard due to a blocked emergency exit. Additionally, Room 101 contains large amounts of flammable material.

INTERIM COMPENSATORY MEASURES

NONE

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- The Highly Enriched Uranium Nitrate (HEUN) in Room 103 is shipped off-site. Draining of tanks and lines is complete with less than 2 Kg. of HEU held up in the entire building which makes an inadvertent criticality a very low probability event.
- Resources continue to be employed to reduce the fire hazard associated with surplus material storage in Room 101.
- These criticality and fire vulnerabilities are covered under vulnerabilities RF-886-001 and RF-886-003 as part of building deactivation efforts.
- The Fire Hazard Analysis is complete for Building 886 which evaluated egress paths and limits the number of personnel accessing the Material Access Area.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Solution draining from the tanks is complete and all solutions collected have been shipped off-site.
- Holdup remediation is part of D&D for the building and is currently planned in the Ten Year Plan with start of Deactivation in FY 98 and with Cluster Closure by the end of FY 01.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-886-003, Holdup in piping and ducts in Building 886.
Radiological surveys of accessible pipes and ducts found approximately 3 KG. HEU in Room 101 piping and transfer lines between Rooms 101 and 103. There were 212 grams HEU found in building exhaust ducts and in the duct between Building 886 and the tunnel to Building 875.* The solution in the pipe presents a potential criticality or exposure hazard, and the duct holdup presents a contamination hazard.

INTERIM COMPENSATORY MEASURES
- Building personnel are aware of the holdup in Room 101 and in transfer lines. No operations are planned in Room 101 (except for limited removal of combustible materials) which minimizes both criticality and exposure concerns pending deactivation. No entrance to the ducts is planned pending decommissioning.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE
- Deactivation of Building 886 will include draining and flushing of pipes in Room 101, in Room 103, and between the two rooms. Deactivation will also perform a rinse of the tanks in Room 103. Deactivation will remove the holdup in pipes, tubing and containers and will iteratively characterize/survey remaining holdup in the facility. It is expected that all remaining holdup in solutions will be removed during deactivation. Holdup in ducts and tunnels will be removed during Facility decommissioning. Simultaneous removal of ducts and holdup facilitates removal and minimizes exposure.
- Material in the assembly hood will be characterized for holdup.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES
- Solution draining from the tanks is complete and all solutions collected have been shipped off-site.
- Holdup remediation is part of D&D for the building and is currently planned in the Ten Year Plan with start of Deactivation in FY 98 and with Cluster Closure by the end of FY 01

* Includes only measured sections. Unmeasured sections are unknown but believed to be less than 1 Kg.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS MOST SIGNIFICANT VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-886-004, Storage of concentrated Highly Enriched Uranyl Nitrate solutions in Raschig ring-filled tanks in Building 886.

Approximately 569 Kg. of HEU in 2700 liters of nitric acid solution are stored in 8 tanks, filled with Raschig rings. No preventive maintenance has been performed on the tanks and associated equipment within the last 7 years. The Raschig rings have not been inspected or tested in many years.

INTERIM COMPENSATORY MEASURES

- Raschig rings have been reinstalled into the pits below the tanks to prevent a criticality if the tanks fail.
- Additional structural bracing is added to the tanks to reduce potential damage in a seismic event.
- The amount of water available to Room 103 is restricted to reduce the addition of a moderator to the storage configuration.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- The HEUN Project in the Site Integrated Stabilization Management Plan (SISMP) outlines the activities necessary to remove the HEUN solutions that are presently stored in tanks in Building 886. The project's objectives are to remove the high hazard solution; place it into safe ten liter storage bottles; package the bottles in Nuclear Regulatory Commission approved FL-10 shipping containers; stage the containers in Building 991 to load them into Safe Secure Transports (SSTs); ship the containers to Nuclear Fuel Services (NFS) in Erwin, TN for conversion to a stable oxide.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- All tanks are drained of HEUN and the building contains less than two kilograms of HEU held-up in piping and ducts. This vulnerability is closed as Closure Category 1A.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-991-001, Authorization basis documentation in Building 991 does not address current hazards and operations.

Currently the facility operates without an updated FSAR, for the current operations being conducted.

INTERIM COMPENSATORY MEASURES

- Detailed reviews of the current FSAR/OSR have been performed to identify any weaknesses or compliance issues.
- Corrective actions have been taken to assure that OSR compliance is being maintained.
- Unreviewed Safety Question Determinations (USQD) have been performed to evaluate proposed changes and potential issues.
- The OSR Page Change process has been improved to provide for timely issue resolution.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- The stored HEU material has been moved out of Building 991.
- HEUN in approved shipping containers being staged for shipment in Building 991, following its removal from Building 886 has been shipped off-site.
- Building 991 will no longer be used to store residues nor for staging off-site shipments after FY 1999. Compensatory measure will continue to be employed until the building is deactivated.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- All packaged waste in Building 991 will be relocated to other storage facilities, principally Building 440 by September 30, 1999.
- All SNM Units and components scheduled for shipment off-site and staged through Building 991 will be complete by the end of FY99.
- Future SNM off-site shipments beyond FY99 will originate from Building 371.
- The new authorization basis document (SAR) for waste storage was submitted for review and approval to RFFO in August 1997. The implementation is expected to be complete by December 31, 1997.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-SITE-001, Management and Integration (M&I) institutional weaknesses and vulnerabilities. As a result of the M&I management structure, confusion exists among facility managers and operators on responsibility for safety aspects such as criticality safety, maintenance and material inventory or control. Additionally, poor communication and a lack of integrated performance measures leads to unspecified or conflicting safety priorities.

INTERIM COMPENSATORY MEASURES

- Several initiatives have been put in place to continue to improve communications at all levels.
  - A weekly Executive meeting is conducted to discuss strategies, decisions, issues and relay important information between the integrator and the subcontractors.
  - Program meetings are conducted weekly to status progress on important risk reduction projects, which represent the plantsite's highest safety priorities beyond maintaining the safety envelope of each facility.
  - At the floor level, all hands meetings are held frequently to conduct training, discuss emerging issues, and receive input from the operators.
  - Many interfaces are performed on a daily basis though out the plantsite on many subjects to plan, status, problems solution, and execute our site closure mission. This wide array of face to face communications are utilized in order to minimize uncertainties regarding priority, expectations, and responsibilities at this Site.
- While some confusion may exist at the floor level regarding some organizational responsibilities, Facility management is clear as to their responsibilities for prioritizing and conducting maintenance and safeguarding the material contained within their areas of responsibility.
  - These geographic areas of responsibility are defined by a detailed listing for each building on plantsite. On those rare occasions when facility ownership is in question or when ownership is being transferred, a joint meeting with the concerned parties has successfully resolved these issues.
  - Many of the Site's organizational charts have been updated recently to reflect any changes since last July and include roles and responsibilities.
  - Criticality Engineering has been transferred to SSOC with Kaiser-Hill retaining the technical oversight of these activities, eliminating any organizational overlap.
- Performance measure are developed in concert with DOE, to perform those activities deemed most beneficial to the Site and the surrounding community. Certain activities are enabling activities that are a precursor to performing a given activity. As such, a subcontractor that requires an enabling activity to be completed, such as developing authorization bases, has a vested interest and is involved in the development and review of the document in order to perform a subsequent activity for which they are incentivized. Each performance measure is very specific, including detailed criteria for performance, and is well understood by all parties involved. By using this disciplined approach, performance expectations and task completion are clear.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY (continued)

RF-SITE-001, Management and Integration (M&I) institutional weaknesses and vulnerabilities.

As a result of the M&I management structure, confusion exists among facility managers and operators on responsibility for safety aspects such as criticality safety, maintenance and material inventory or control. Additionally, poor communication and a lack of integrated performance measures leads to unspecified or conflicting safety priorities.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Kaiser-Hill will utilize a project based management approach for the Rocky Flats Environmental Technology Site (RFETS) to promote further improvements in communications, planning, integration and accountability resulting in greater management coordination and control over Site activities.
  - The use of a project based approach brings manageability to the task of integration through development of project life-cycles with a definite beginning and end of a given project, and include a defined scope, resources and budget for the project. With clarity of the project, improved understanding of roles and responsibilities will result by management and floor level alike.
  - Toward this goal, several major steps have been accomplished. 1) The FY 1997 Site Work Breakdown Structure (WBS) has been created to reflect a project based management approach, and has been used as a guide for the allocation of funds. 2) An Integrated Site Baseline (ISB) has been created to facilitate resource allocation and document the project plan. The two taken together will allow the Site to identify the sequencing of activities and needed resources and the activities to be performed. 3) The two together, as part of the FY 1997 budget and by using the ten year plan, will develop life cycle costs to assist in future year planning. All Site members can understand the context in which they perform tasks and the Site will then have a tool to manage change and determine future activities and resulting performance measures.
- To support this new philosophy, a Site reorganization will take place to be accomplished in two phases:
  - The first phase at the Executive level, is completion of the WBS.
  - The second phase is the selection of Project Managers and their assignment to the projects as outlined in the WBS. During this transition, some facilities and work scope will be reassigned among the subcontractors to better align Site closure strategy with corporate expertise.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- The new WBS is complete.
- The initial ISB was published by December 1, 1996, and will be updated semi-annually in FY 98 and annually there after.
- Work has been reorganized according to the new WBS
- Project Managers for each Building Cluster are chosen
- The Monthly Progress Review briefing provides monthly status on safety performance, Authorization Basis Violations, internal SSOC Audits/Assessments and Nuclear Criticality Safety Occurrences and Infractions and shows improvement in all areas over the last two years.

This vulnerability can be closed as a Category 1A Closure.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-SITE-002, Criticality safety institutional weaknesses and vulnerabilities.
Operations does not convey ownership of criticality safety and corrective actions. The interface between the criticality safety group and operational organizations is poor.

INTERIM COMPENSATORY MEASURES

- Project teams have been initiated to pull together operations personnel and criticality safety personnel to enable discussion between the groups in addressing the drum/can storage criticality safety issues. The project teams will collectively determine the necessary actions to ensure criticality safety for the facilities and prioritize the actions.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- The Site has issued a new Nuclear Criticality Safety Manual (NCSM) that better defines roles and responsibilities and creates the Criticality Safety Officer position.
- SSOC has developed a Criticality Safety Improvement Plan (CSIP) which will further clarify roles and responsibilities, promote team building between the criticality safety group and operational organizations, and establish the line ownership of criticality safety.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- The schedule for the new NCSM implementation and the CSIP includes many milestones and deliverables as generated by the specific plan. Both plans entail long-term Site-wide actions that will not be fully implemented until FY 1998. Detailed actions and completion dates are described in the NCSM and the CSIP. The 103 elements in the CSIP are scheduled to be complete by March 1, 1998 (98 currently complete), with completion of physical upgrades to the Criticality Alarm System tied to the Criticality Alarm and Production Annunciation System Upgrade (CAPASU) capital project.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-SITE-003, Layoffs/loss of experienced personnel.
As a result of layoffs and low worker morale, unsafe conditions exist in many facilities including Buildings 371,771 and 776/777. Conditions include excessive combustible loading and hampered emergency egress. Additionally layoffs are hampering the work of the criticality safety group and the maintenance group in meeting operational commitments.

INTERIM COMPENSATORY MEASURES

- The Criticality Safety group is presently experiencing an above normal work load due to several factors.
  - The affect of staff reductions due to voluntary separations.
  - The analytical support necessary to process existing criticality safety evaluations.
  - Support for the Unresolved Safety Question Determination discovery issues.

  As these items are worked-off in the coming months, the workload will more closely match the resources available.
- As both a compensatory measure and longer term solution, Safe Sites of Colorado (SSOC) is pursuing additional Criticality Engineers from other sites and from subcontractors around the country. As this is a limited resource throughout the industry, staff augmentation has been difficult. Responses to employment efforts are expected this calendar year.
- Maintenance actions to support safe operations and maintain the safety envelope are sufficient. The backlog has been reduce in the past year and is expected to remain at least flat in the coming year. Facility Managers constantly review the backlog and establish priorities to support not only safety envelope but risk reduction work as well. Housekeeping has improved due to clean-up efforts in the noted facilities. In addition, SSOC has initiated a senior management tour program with a specific requirement for general safety and housekeeping. Areas where egress routes were hampered will be corrected as discussed in RF-371-001 and RF-771-001.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- The layoffs that have occurred in the last year (approximately 2400 employees) were necessary to bring the plant population in line with the projected funding levels for the next five years. Funding in the future is expected to remain constant and the trauma experienced by the Site employees which results from funding and employment uncertainties should be alleviated for the foreseeable future.
- As buildings are vacated due to removal of materials, resources can be reallocated to those facilities with a longer term mission. Levels of support from maintenance, radiation protection, etc., will remain at levels necessary to maintain safety and support additional risk reduction until Site closure is achieved.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY (continued)

RF-SITE-003, Layoffs/loss of experienced personnel.
As a result of layoffs and low worker morale, unsafe conditions exist in many facilities including Buildings 371,771 and 776/777. Conditions include excessive combustible loading and hampered emergency egress. Additionally layoffs are hampering the work of the criticality safety group and the maintenance group in meeting operational commitments.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE (continued)

- In preparation for Operational Readiness Assessments in several buildings, housekeeping, combustible loading, maintenance and many other topical areas must be brought to an improved level in order to proceed with mission activities. Preparations and execution of deactivation activities will also address these issues resulting in reduced vulnerabilities
- SSOC has also developed a comprehensive improvement plan that addresses many concerns contained in this HEU Vulnerability Report, such as housekeeping, maintenance, personnel qualification, Conduct of Operations Program, etc. These improvements, coupled with the Site restructuring discussed in RF-Site-001 will correct many of the concerns as noted in this report.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- The schedule for building deactivation activities are detailed in the Rocky Flats 10 year plan.
- The Combustible Control Program is implemented in all buildings.
- The SSOC comprehensive improvement plan began implementation in FY97 and selected elements will continue to be executed in FY 1998. An evaluation will be performed in FY98 to assess completeness of the plan objectives.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS MOST SIGNIFICANT VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-SITE-004, Fire protection program weaknesses in all buildings.

Weaknesses in the fire protection program increase the likelihood and consequences of a facility fire. Inadequate control of combustibles, overdue FHA updates, excessive system impairments, egress path obstructions and inadequate emergency lighting all contribute to an overall decrease in worker safety and were identified in Buildings 371, 707, 771, 776/777, 779, 883, and 886.

INTERIM COMPENSATORY MEASURES

- Automatic fire suppression and alarm systems are surveilled on a periodic basis to confirm operability.
- Designated gloveboxes in Buildings 371 and 707 are purged with nitrogen to less than 5% oxygen with local alarms set to alarm at 5%.
- Pu containers are placed on 140° F heat detectors and glovebox ceilings contain 190° F fire detectors.
- Heat detectors ahead of the filter plenums automatically activate the demister system and there is a manual deluge system before the first stage HEPA filters.
- Fire watches are instituted whenever there are system outages or surveillance failures, and are maintained until the problem is corrected.
- The Fire Department maintains a high state of readiness and responds to alarms within required time limits.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- To mitigate excessive system impairments, the Plant Fire/Security System Replacement (PFSR) project is funded: to upgrade the Fire Alarm systems including heat and smoke detection, sprinkler flow and plenum flow detectors, dry chemical and CO_2 release and manual pull stations with multiplexed panels in 13 main building locations; to upgrade the personnel access control systems; and to upgrade the security alarms systems for those facilities that will continue to be used. Interim compensatory measures will continue to be use for those facilities slated for deactivation (Buildings 771, 776/777, 779 and 991)
- Waste consolidation is currently going to Building 991, to recently opened Building 440, and planned to the Waste Isolation Pilot Plant (WIPP) when open for Transuranic waste storage. This is part of the Protected Area (PA) Waste Evacuation Plan and will substantially improve egress and reduce combustible loading in the buildings.
- As each building upgrades their Authorization Basis (AB) Documentation, fire loading and hazard analysis are determined. This has already occurred in Buildings 559, 707, 886, and 771/774. Buildings 371, and 771 are in the process of updating Fire Hazard Analyses as part of the AB process. Periodic surveillance by the Fire Department reviews actual practice with established standards to identify needed corrective actions.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Completion of the PFSR project, within current funding guidance, is currently scheduled for the end of FY 2000.
- Waste consolidation into Building 440 has begun. WIPP is currently scheduled to open by May 1998. Waste consolidation will continue and will support Deactivation until completion in FY2015.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-SITE-005, Lack of contaminated firewater runoff control in all buildings.
Use of water for automatic or manual suppression of any site fire involving HEU could result in fire water dispersal to the environment. None of the buildings at RFETS are provided with containment features to prevent water from running under doors or through barrier breaches.

INTERIM COMPENSATORY MEASURES

- The RFETS Fire Department developed a protocol on October 18, 1993, 4-65100-SOP-240, Control of Fire Water Runoff, which stipulates both primary and secondary containment actions. Primary containment consists of evaluation of tactical methods to contain or control water, and use of dikes, dams and retention ponds. Secondary containment assumes water has breached the building, and relies on containment within the Site retention pond containment system. Existing procedures are appropriate for all facilities at RFETS.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Same as Interim Compensatory Measures.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Existing procedures as identified in interim Compensatory Measures will be followed. Changes to this procedural process will be made dependent on future D&D plans for the facility.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-SITE-006, Inadequate control of fire suppression deluge systems protecting HVAC plenums in Buildings 371 and 771.

HVAC plenum sprinkler systems are provided with pressure/flow control valves to limit the volume of water introduced into the plenums. These valves are not locked to prevent mispositoning. Mispositioned valves could either starve firewater flow or cause a criticality due to water carrying fissile material to collection tanks with unsafe geometry. The tanks currently are filled with Raschig rings, however the rings have not been certified and Rocky Flats does not take safety credit for them.

INTERIM COMPENSATORY MEASURES

- Building 771 pressure/flow control valves are fitted with "cone" covers that, in effect, lock out the potential for mispositioning these valves. A turnkey must be removed in order to remove the cover This removal becomes a deliberate process which would modify the positioning of these valves by the fire systems engineers. For Building 371, valve covers are identified in a work order processed on March 25, 1996, for installation as determined by building operations management.

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Install valve covers on Building 371 pressure/flow control valves, according to work order of 3/25/96.
- Continue to perform LCO surveillance's as required including monthly valve position checks and annual flow tests.
- Tanks have been dispositioned as safe for use through the USQD process.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- The installation of valve covers in Building 371 was completed in September 1997.

This vulnerability can be closed as a Category 1A Closure.

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS MOST SIGNIFICANT VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-SITE-007, Implementation of criticality safety controls for materials storage in Building 707 and 776/777.

There is insufficient information in the field to determine that stored highly enriched uranium is within criticality safety limits. The system for making this determination is vulnerable to human error. Further, administrative controls to remain below these limits are not formally implemented. A notable exception to this was the solutions in Building 779. Current and historical information was posted and tracked at the work location in Building 779.

INTERIM COMPENSATORY MEASURES

- Criticality limits are very conservatively established for HEU since all Special Nuclear Material (SNM) in these buildings, for criticality purposes, are considered to be plutonium to preclude the unlikely event of plutonium being mistaken for uranium.
- SNM mass limits and configuration within gloveboxes are monitored to prevent inadvertent additions of SNM that could lead to a criticality.
- Criticality safety reviews are conducted on all process operations to set Criticality Safety Operating Limits (CSOLs) before implementation to assure criticality safety is incorporated

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Within current risk prioritized funded activities, and taking into account safety and security concerns, Special Nuclear Material (SNM) movement will continue to be controlled by Material Control and Accountability (MC&A) personnel. The two person rule requires that MC&A personnel be present for all SNM moves. As long as their presence is required, material quantities in specific locations are known through their Safeguards Accountability Network database. Also, a program to mark all containers with SNM mass quantities is included in the Criticality Safety Manual.
- HEU will continue to be shipped off-site when appropriate.
- Nuclear Material Drum Transfer Requests are reviewed by MC&A personnel against current CSOLs before the work starts to minimize potential criticality incidents and infractions.
- The new program of having Criticality Safety Officers in each building will increase awareness for criticality safety. Designated individuals are being trained for this new duty.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- Personnel training is conducted through the Site's General Employee Radiation Training, Radiation Worker I and II, and Criticality Safety classes on annual and biannual schedules.
- When operation or implementation issues arise, the Lessons Learned program highlights specific issues and their solutions that are then distributed to other operating areas.
- Mass quantity marking on packages is scheduled to begin in October 1996, as SNM is moved within and from vaults. This methodology and start date are based on the low probability of a criticality due to conservatively established criticality limits; the need to fund other more immediate potentially higher risk threats; and to keep personnel exposures to As Low As Reasonably Achievable.
- All non-Pu contaminated HEU metal is scheduled to be shipped to Y-12 by the end of FY 1998.
- The Criticality Safety Officer Program completed implementation in April 1997

HEU ES&H VULNERABILITY ASSESSMENT
ROCKY FLATS VULNERABILITIES

DESCRIPTION OF VULNERABILITY

RF-SITE-008, Operating personnel's awareness of form and amounts of fissile material present in Buildings 707, 776/777, and 991.

During walkdown activities in Buildings 707, 776/777, and 991 the WGAT requested to observe HEU present in facilities. In Buildings 776/777 and 991 responsible operating personnel were unable to provide comprehensive HEU storage locations. An awareness of the forms of material present (pyrophoric), approximate number of containers or mass of HEU was not demonstrated during the each walk through.

INTERIM COMPENSATORY MEASURES

NONE

PROPOSED CORRECTIVE ACTIONS TO CLOSURE

- Brief appropriate responsible operating personnel on amounts, types, and locations of HEU present in buildings.
- Establish system of routine training on HEU present in buildings.

SCHEDULE FOR CORRECTIVE ACTIONS COMPLETION WITH MAJOR MILESTONES

- A roster identifying appropriate personnel for training is completed.
- Briefings were held highlighting each issue.
- A system of routine training until all HEU is removed will be developed and implemented for all buildings by September 30, 1998.

Attachment II

Plutonium Vulnerabilities Corrective Action Plans

Vulnerability	
RFP-371-A	complete pending DOE review
RFP-371-B	complete pending DOE review
RFP-771-A	open
RFP-771-B	closed
RFP-776-A	open
RFP-776-B	open
RFP-779-A	closed
RFP-779-B	closed
RFP-779-C	closed
RFP-MB-A	open
RFP-MB-B	closed
RFP-SW-A	open
RFP-SW-B	open
RFP-SW-C	closed
RFP-SW-D	open
RFP-SW-E	open
RFP-SW-F	open
RFP-SW-G	closed
RFP-SW-H	open
RFP-SW-I	closed
RFP-SW-J	complete pending DOE review
RFP-SW-K	closed
RFP-SW-L	closed
RFP-SW-M	closed
RFP-SW-N	open
RFP-SW-O	closed
RFP-SW-P	closed
RFP-SW-Q	open
RFP-SW-R	open
371-01	closed
371-02	closed
371-03	open
371-04	complete pending DOE review
371-05	open
371-06	open
371-07	open
559-01	closed
559-02	closed
559-03	open
559-04	complete pending DOE review
559-05	closed
559-06	closed

559-07	closed
559-08	complete pending DOE review
559-09	closed
707-01	closed
707-02	closed
707-03	complete pending DOE review
707-04	complete pending DOE review
707-05	open
707-06	open
707-07	complete pending DOE review
707-08	closed
771-01	closed
771-02	closed
771-03	open
771-04	complete pending DOE review
771-05	open
771-06	open
771-07	open
771-08	complete pending DOE review
771-09	closed
776/777-01	closed
776/777-02	closed
776/777-03	open
776/777-04	complete pending DOE review
776/777-05	open
776/777-06	open
776/777-07	open
776/777-08	complete pending DOE review
776/777-09	closed
776/777-10	closed
779-01	closed
779-02	closed
779-03	complete pending DOE review
779-04	complete pending DOE review
779-05	open
779-06	closed
779-07	closed
779-08	complete pending DOE review
779-09	closed
779-10	closed
991-01	closed
RFP-SW-SI-1	closed
RFP-SW-SI-2	closed
RFP-SW-SI-3	open
RFP-SW-SI-4	closed

Highly Enriched Uranium Vulnerabilities Corrective Action Plans

Vulnerability

RF-371-001 closed
RF-371-002 open
RF-707-001 complete pending DOE review
RF-771-001 closed
RF-771-002 closed
RF-771-003 closed
RF-771-004 open
RF-771-005 open
RF-776/777-01 open
RF-776/777-002 open
RF-881-001 open
RF-881-002 corrective action plan is unacceptable
RF-881-003 open
RF-881-004 open
RF-883-001 open
RF-886-001 open
RF-886-002 open
RF-886-003 open
RF-886-004 closed
RF-991-001 open
RF-Site-001 complete pending DOE review
RF-Site-002 open
RF-Site-003 open
RF-Site-004 open
RF-Site-005 open.
RF-Site-006 complete pending DOE review
RF-Site-007 open
RF-Site-008 open